



# *Cyber Security at NSU*

Aurelia T. Williams, Ph.D.

Chair, Department of Computer Science  
Associate Professor of Computer Science

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# Background

- ❖ Undergraduate computer science degree program began in 1982
- ❖ National accreditation was first earned in 1991 with continuous reaffirmation since that time (currently ABET)
- ❖ Information assurance (cyber security) initiatives began in 2003
- ❖ MS in Computer Science was initiated in 2003

# Current Cyber Security Offerings

- ❖ BS in Computer Science, Information Assurance Emphasis
- ❖ MS in Computer Science, Information Assurance Emphasis
- ❖ MS in Cyber Security (Online Program Starting Fall 2015)

# Variety of Course Offerings

❖ Fundamentals of Cyber Security	3 credits
❖ Computer Security I	3 credits
❖ Cryptography and Network Security	3 credits
❖ Management of Information Security	3 credits
❖ Digital Forensics	3 credits
❖ Secure Operating Systems	3 credits
❖ Network Fundamentals	3 credits
❖ Computer and Network Forensics	3 credits
❖ Human Aspects of Cyber Security	3 credits
❖ Ethical Hacking and Penetration Testing	3 credits
❖ Database Security	3 credits
❖ Healthcare Information Security	3 credits
❖ Advanced Topics in Cyber Security	3 credits
❖ Cyber Security Capstone	6 credits

# NSA/DHS Center of Academic Excellence

- ❖ The National Security Agency (NSA) and the Department of Homeland Security (DHS) jointly sponsor the National Centers of Academic Excellence (CAE) in Information Assurance (IA)/Cyber Defense (CD)
- ❖ The goal of these programs is to reduce vulnerability in our national information infrastructure by promoting higher education and research in Information Assurance/Cyber Defense (IA/CD) and producing a growing number of professionals with IA/CD expertise in various disciplines
- ❖ Initial designation in 2009; currently designated through 2020
- ❖ Of the 147 universities certified under the new standards, NSU is 1 of 6 Virginia universities to receive this distinction and 1 of 3 HBCUs nationwide
- ❖ Required that Information Assurance courseware address a core (mandatory) set of IA/CD Knowledge Units (KUs) in addition to five other KUs

# *Cyber Security Grant Funding*

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# New Grants



- ❖ NSU leads a \$25M collaborative effort funded by the Department of Energy to develop a K-20 pipeline for the workforce; the project will pilot a workforce development program to produce well-qualified cyber security professionals in **significant** numbers to address the pressing cyber security workforce shortage
- ❖ Partners include other HBCUs and national energy laboratories.

# New Grants (continued)

- ❖ NSU leads a \$4.98M collaborative effort funded by the Department of Defense through a cooperative agreement managed by Air Force Research Laboratory (AFRL) to establish a Center of Excellence in Cyber Security with an emphasis in research
- ❖ The objective of the Center is to conduct basic research in developing a cloud-based, big-data-analytics-capable **Cyber Analysis, Simulation and Experimentation Environment (CASE-V)** to enhance situational awareness and decision support capabilities for cyber defense and cyber training
- ❖ Partners include ODU/Virginia Modeling, Analysis and Simulation Center and Tennessee State University





# Other Recent External Funding

- ❖ DoD, IA Scholarship Program - \$350K
- ❖ ARO, Building a Cloud Computing and Big Data Infrastructure for Cyber Security Research and Education - \$498K
- ❖ ARO, Self-Protecting Security for Assured Information Sharing - \$487K
- ❖ NSF, Scholarships for Service - \$1.5M
- ❖ DoE, Massie Chair of Excellence in Information Assurance - \$1.25M
- ❖ DoE, Addressing the Shortage and Quality of Cyber Security Workers through Relevant and Dynamic Training - \$770K

# *NSU Cyber Security Capabilities and Facilities*

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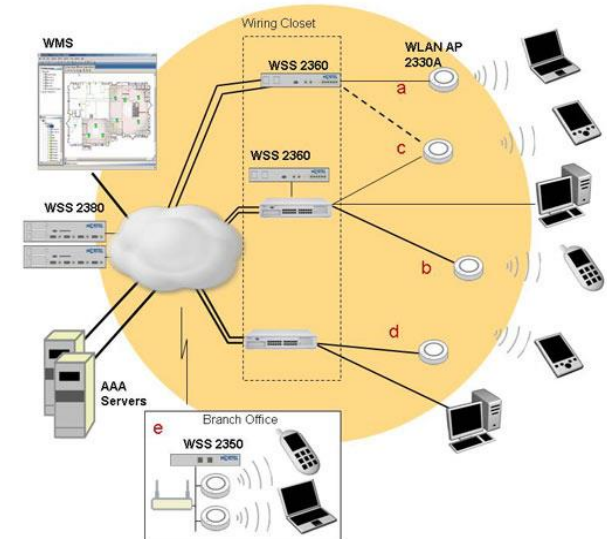
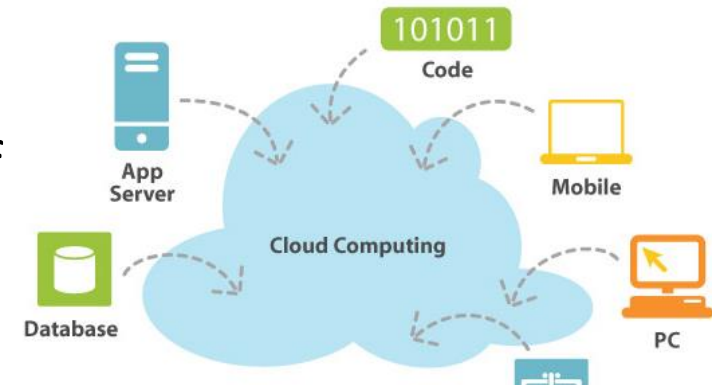
# Equipment and Software

## ❖ NSU has extensive cyber security capabilities:

- Information Assurance Research Education and Development Institute offers a mini classroom with 30 laptops and 20 workstations equipped with a wide range of cyber security tools. The classroom is used to teach computer hacking techniques and to practice for cyber security competitions.
- NSU has invested in NDG Netlab + virtual machine hosting equipment which gives us the capability to provide web based access virtual machine cyber security laboratory exercises. Currently, 40 lab exercises have been published on ethical hacking and security+. Digital forensic laboratory exercises will be published in the near future.
- A digital forensics laboratory is equipped with Encase, FTK and P2 Commander host forensic tools as well as mobile forensic offerings from Celldek, Cellebrite and Paraben. There are several Digital Forensic workstations equipped with a variety of the latest digital forensic software and a FRED Data center. Other forensic related equipment includes Digital Forensic Ultrakits, mobile devices, and smart phones.
- A Network laboratory is equipped with reconfigurable networks utilizing Cisco switches and PC based workstations.

# Faculty

- ❖ NSU has ten faculty members actively involved in cyber security.
- ❖ These faculty members teach a range of cyber security courses, direct undergraduate and graduate student research, perform cyber security outreach and are active in pursuing and obtaining external funding.
- ❖ Faculty research includes Digital Forensics, Cloud Computing, Wireless Security, Wireless Sensor Networks, Big Data Analysis, Security Policy and Intelligent Intrusion Detection systems.



# Partnering with Others

NSU is well equipped to assist others with:

## ❖ Curriculum development

- Developing cyber security modules to be integrated within existing courses
- Developing Information Assurance/Cyber Security courses
- Developing Cyber Security certificate programs
- Developing complete IA/Cyber Security curricula

## ❖ Faculty/Staff Development

- Provide faculty/staff with basic cyber security skills
- Train faculty how to teach cyber security

## ❖ Research Initiatives

# Cyber Security Strengths Summary

- ❖ Designated NSA/DHS Center of Academic Excellence in Cyber Defense Education through 2020
- ❖ Extensive online cyber security laboratories and facilities and the capability of delivering programs worldwide
- ❖ Familiarity with the capabilities of online competitors
- ❖ Collaborations with national laboratories and other government agencies
- ❖ Well-qualified faculty
- ❖ Significant external funding



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